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VOICE GRADE INFORMATION TRANSMITTING DEVICE

Sachihiro Fujimoto

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VOICE GRADE INFORMATION TRANSMITTING DEVICE

[Onseitaiiki joho densosochi]

Inventor:	Sachihiro Fujimoto
Applicant:	000005821 Matsushita Electric Industrial Co., Ltd.

[There are no amendments to this patent.]

Claims

1. A voice grade information transmitting device characterized by having the following on the sending side: a coding means for compressing voice signals, a means for detecting non-voice signals, a means for storing data obtained by compressing the non-voice signals using the aforementioned coding means in advance, and a means for selecting and outputting either the data obtained by compressing voice signals or the data obtained by compressing the aforementioned non-voice signals and characterized by having the following on the receiving side: a decoding means for extending the compressed voice signals, a means for storing the data obtained by compressing the non-voice signals using the aforementioned coding means in advance, a means for detecting the consistency with one of the aforementioned compressed data

if the compressed data transmitted from the sending side are non-voice signals, a means for generating non-voice signals based on the aforementioned compressed data without using the decoding means, and a means for selecting and outputting either the data obtained by decoding the voice signals or the data obtained by generating the non-voice signals.

2. The voice grade information transmitting device described in Claim 1 characterized by the fact that compression and extension are carried out in a unit of one frame on the sending and receiving sides, and the means for storing the data obtained by compressing the non-voice signals with the coding means in advance can store compressed information of one frame for various types of DTMF signals.

Detailed explanation of the invention

[0001]

Industrial application field

The present invention pertains to a voice coder and decoder used in voice digital wire and wireless communication. In particular, the present invention pertains to a voice grade information transmitting device that can transmit DTMF signal or other non-voice signals using the voice frequency band.

[0002]

Prior art

In some cases, DTMF signal or other non-voice signals cannot be transmitted correctly through a high efficiency voice coder and decoder due to distortion of the signals occurring in company with coding and decoding. Therefore, in a conventional technology, as shown in Figure 3, when DTMF signals are input to voice grade signal input terminal (1), the signals are detected by a DTMF detector (3) that is separate from high efficiency voice coder (2). Terminals b and d are connected with switch (4). One bit indicating the detection result and the codes that express the type of DTMF are transmitted through a digital circuit (5). Figure 4 shows the data format on digital circuit (5). The bit for determining whether the signal is DTMF signal is denoted as s and is followed by the voice/DTMF data to constitute one frame.

[0003]

On the receiving side, whether DTMF signal is detected is detected by judgment bit detector (6). Terminals b and d are connected with switch (9). The DTMF signals generated by DTMF generator (8) depending on the codes that express the type and that are sent from digital circuit (5) are output to voice grade signal output terminal (10). In this way, high-quality DTMF signals can be transmitted free of distortion occurring in company with coding and decoding.

[0004]

Problem to be solved by the invention

In the aforementioned conventional voice grade information transmitting device, however, it is necessary to add a judgment bit to discriminate the voice signals from non-voice signals in a frame. As a result, the information used for voice is reduced.

[0005]

The objective of the present invention is to solve the aforementioned problem by providing a voice grade information transmitting device that can transmit high-quality DTMF signals even if there is no judgment bit added.

[0006]

Means to solve the problem

The present invention provides a voice grade information transmitting device characterized by having the following on the sending side: a coding means for compressing voice signals, a means for detecting non-voice signals, a means for storing data obtained by compressing the non-voice signals using the aforementioned coding means in advance, and a means for selecting and outputting either the data obtained by compressing voice signals or the data obtained by compressing the aforementioned non-voice signals and characterized by having the following on the receiving side: a decoding means for extending the compressed voice signals, a means for storing the obtained by compressing the non-voice signals using the aforementioned coding means in advance, a means for detecting the consistency with one of the aforementioned compressed data if the compressed data transmitted from the sending side are non-voice signals, a means for generating non-voice signals based on the aforementioned compressed data without using the decoding means, and a means for selecting and outputting either the data obtained by decoding the voice signals or the data obtained by generating the non-voice signals.

[0007]

Operation

By using the aforementioned configuration, the voice grade information transmitting device of the present invention can detect input of non-voice signals, transmit information compressed by a coding means in advance, detect the information compressed by the coding means on the receiving side, and generate the non-voice signals without using the decoding means.

[0008]

Application example

In the following, an application example of the present invention will be explained with reference to figures. Figure 1 is a block diagram illustrating the configuration of the voice grade information transmitting device disclosed in an application example of the present invention. In Figure 1, (11) represents a voice grade signal input terminal, (12) represents a high efficiency voice coder that can compress voice signals, (13) represents a DTMF detector for detecting non-voice signals, (14) represents a DTMF coded pattern memory for storing the data obtained by compressing non-voice signals with high efficiency voice coder (12) in advance, (15) represents a switch for selecting and outputting either the data obtained by compressing the voice signals or the data obtained by compressing the non-voice signals. The device on the sending side is comprised of the aforementioned parts. (16) represents a digital circuit that connects the device on the sending side to the device on the receiving side.

[0009]

In the device on the receiving side, (17) represents a high efficiency voice decoder that can extend the compressed voice codes, (18) represents a DTMF coded pattern memory that is identical to DTMF coded pattern memory (14) on the sending side and is used to store the data obtained by compressing the non-voice signals in advance, (19) represents a DTMF coded pattern detector used for detecting the consistency with the data stored in DTMF coded pattern memory (18) if the compressed data transmitted from the sending side are non-voice signals, (20) represents a DTMF generator that can generate non-voice signals based on the pattern with the consistency without using high efficiency voice decoder (17), (21) represents a switch for selecting and outputting the data obtained by decoding the voice signals or the data obtained by generating the non-voice signals, (22) represents a voice grade signal output terminal.

[0010]

Figure 2 is a schematic diagram illustrating an example of the content in DTMF coded pattern memories (14), (18) in this application example. One frame of compressed data of PB signals corresponding to various digits is stored from address 0 to address N.

[0011]

In the following, the operation of the present application example will be explained. In Figure 1, the voice signals or DTMF signals input to voice grade signal input terminal (1) on the sending side are output to terminal a of switch (15) as data compressed by a coding algorithm in

the unit of one frame (such as 10 ms) by using high efficiency voice coder (12). It is also determined whether the signals are DTMF signals in the unit of one frame by using DTMF detector (13). If the signals are DTMF signals, the codes of that type are output to DTMF coded pattern memory (14), and a switching signal is output to terminal c of switch (15). DTMF coded pattern memory (14) stores information obtained by compressing one frame of various types of DTMF signals using high efficiency voice coder (12) in advance. The compressed data corresponding to the code output from DTMF detector (13) are selected and output to terminal b of switch (15).

[0012]

In the case of regular voice signals, terminals a and d of switch (15) are connected to each other to output the compressed voice data from high efficiency voice coder (12) to digital circuit (16). On the other hand, if DTMF signals are detected, terminals b and d are connected to each other to output the compressed data from DTMF coded pattern memory (14) to digital circuit (16).

[0013]

On the receiving side, there is a DTMF coded pattern memory (18) that is the same as that on the sending side. When the compressed data input from digital circuit (16) are detected as DTMF signals by DTMF coded pattern detector (19), the consistency with the content in DTMF coded pattern memory (18) is detected. The code of the pattern with the consistency is output to DTMF generator (20), and a switching signal is output to terminal c of switch (21).

[0014]

The DTMF signals corresponding to the code sent from DTMF coded pattern detector (19) are generated by DTMF generator (20). In the case of regular voice signals, terminals a and d of switch (21) are connected to each other to output the extended data sent from high efficiency voice decoder (17) to voice grade signal output terminal (22). On the other hand, when a DTMF coded pattern is detected, terminals b and d are connected to each other to output the DTMF signal output from DTMF generator (20).

[0015]

Effect of the invention

As described above, according to the present invention, non-voice signals compressed by a voice signal compression means, for example, a data pattern obtained by compressing one frame of various types of DTMF signals is used. When DTMF is detected on the sending side,

the pattern is sent to the receiving side, and DTMF signals are generated based on this pattern on the receiving side. In this way, high-quality DTMF signals free of distortion can be generated on the receiving side without adding a special bit for control.

Brief description of the figures

Figure 1 is a block diagram illustrating the configuration of the voice grade information transmitting device disclosed in an application example of the present invention.

Figure 2 is a schematic diagram illustrating an example of the content in the DTMF coded pattern memory used in the application example.

Figure 3 is a block diagram illustrating the configuration of a conventional voice grade information transmitting device.

Figure 4 is a schematic diagram illustrating the transmission format in the conventional example.

Explanation of symbols

11 Voice grade signal input terminal
12 High efficiency voice coder
13 DTMF detector
14 DTMF coded pattern memory
15 Switch
16 Digital circuit
17 High efficiency voice decoder
18 DTMF coded pattern memory
19 DTMF coded pattern detector
20 DTMF generator
21 Switch
22 Voice grade signal output terminal

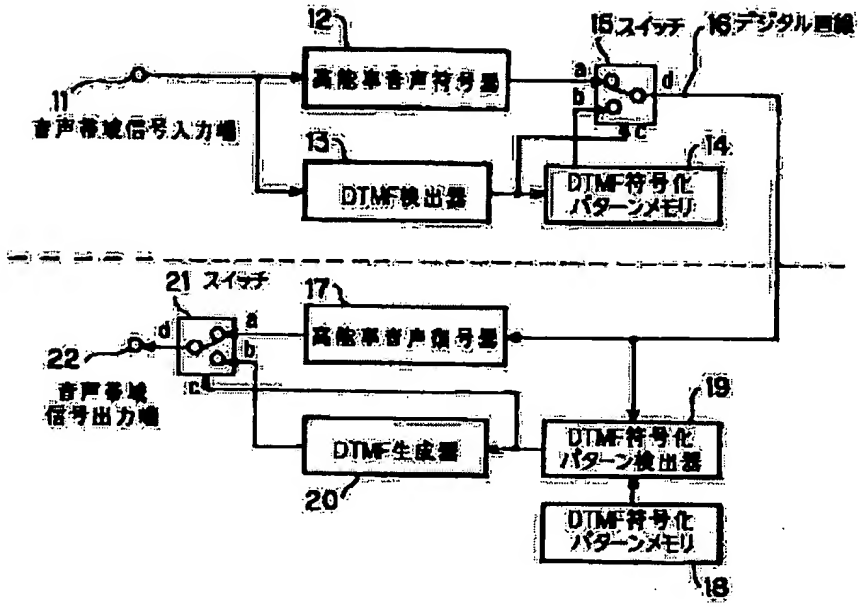

Figure 1

Key:
11 Voice grade signal input terminal
12 High efficiency voice coder
13 DTMF detector
14 DTMF coded pattern memory
15 Switch
16 Digital circuit
17 High efficiency voice decoder
18 DTMF coded pattern memory
19 DTMF coded pattern detector
20 DTMF generator
21 Switch
22 Voice grade signal output terminal

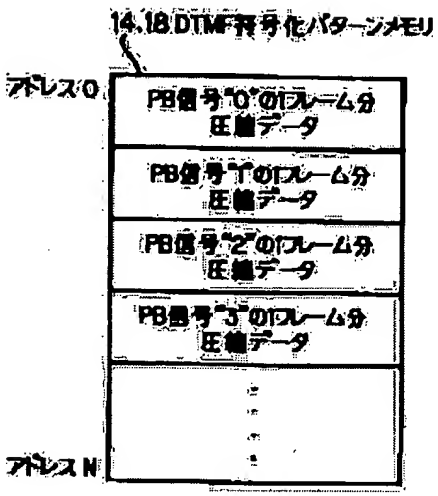

Figure 2

Key: 14, 18 DTMF coded pattern memory
a Address 0
b Address N
c One frame of compressed data of PB signal "0"
d One frame of compressed data of PB signal "1"
e One frame of compressed data of PB signal "2"
f One frame of compressed data of PB signal "3"

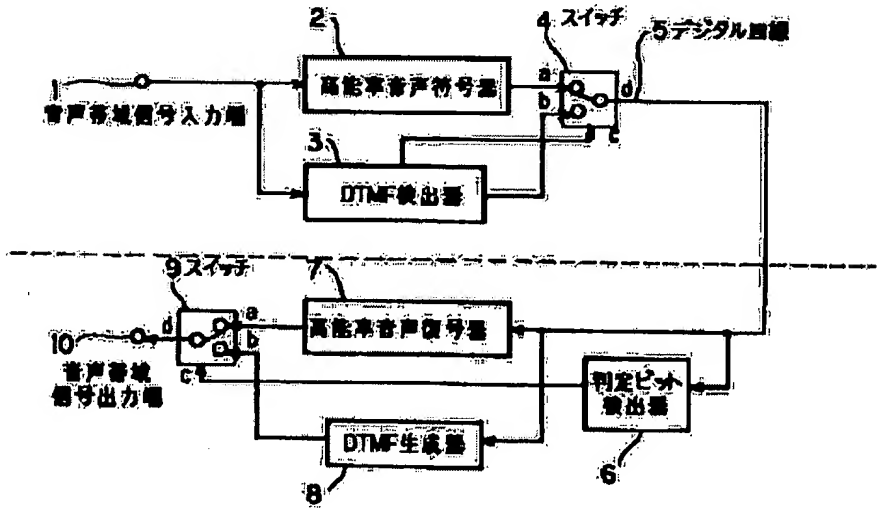

Figure 3

Key: 1 Voice grade signal input terminal
2 High efficiency voice coder
3 DTMF detector
4 Switch
5 Digital circuit

6 Judgment bit detector
7 High efficiency voice decoder
8 DTMF generator
9 Switch
10 Voice grade signal output terminal

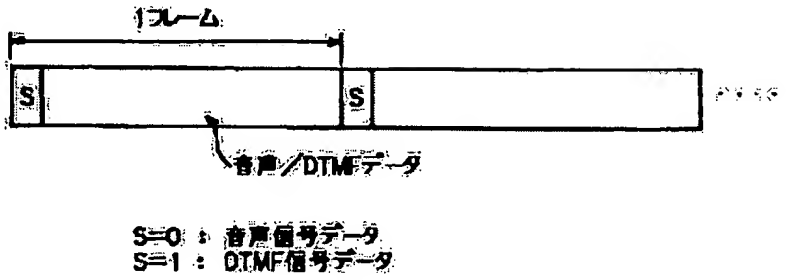

Figure 4

Key: 1 Frame
2 Voice/DTMF data
3 S = 0: Voice signal data
4 S =1: DTMF signal data